

Generating Week-2 Real Time Forecasts

**First WMO RCC-Washington Training Workshop
Washington DC, USA,
30 September 2019 – 4 October 2019**

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Description of the Script

- A single line shell (Linux command) that generates GEFS/CFSv2 Week-1/2 Forecasts

```
bash plot_all.sh 'west' 'east' 'south' 'north'
```



Week-1/2 circulation, and rainfall and 2m temperature forecasts



Tools for Operational Week-1/2 Forecasts

What Does It Do?

- A shell script, GrADS codes embedded in it
- The Shell (Linux) part:
 - Downloads GEFS/CFSv2 Forecast data
 - GEFS, 4 data files: [week-1 precip](#), [week-1 t2m](#), [week-2 precip](#) and [week-2 t2m](#)
 - CFSv2, 2 data files: [week-2 precip](#) and [week-2 t2m](#)
 - Generates [six GrADS control files](#) corresponding to the six data files.

What Does It Do? (Cont.)

- The Shell (Linux) part (cont.):
- Generates three GrADS Scripts (two for GEFS and one for CFSv2), to plot:
 - Week-1/2 Lower and Upper level Wind and Divergence Anomalies
 - Week-1/2 Rainfall and 2m Temperature Anomalies, 2-category and Calibrated Probabilistic Forecasts
 - Week-1/2 Rainfall Exceedance Probability
- Moves the GrADS output figures into different folders (`gefs_week1_figures`, `gefs_week2_figures` and `cfsv2_week2_figures`)

Download Data and Scripts

1. Download the subseasonal script

On your Linux/Cygwin terminal, type:

wget <https://ftp.cpc.ncep.noaa.gov/International/usrc/training/2019/day4/subseason.tar.gz>

2. Use the command below to unzip the file

```
tar -xvf subseason.tar.gz
```

3. Change your directory to the subseason folder, and type ls to examine the file/directory structure

```
cd subseason
```

```
ls
```



```
blank_map.sh          index.html
cfsv2_week2_figures  plot_all.sh
gefs_week1_figures   plot_cfsv2_week2_anomalies.sh
gefs_week2_figures   plot_gefs_week1_anomalies.sh
gradsupp              plot_gefs_week2_anomalies.sh
(base) ebekele@vm-lnx-cpcwork1>
```

Make a Test Run

Change file permission for all shell script files:

```
chmod 755 *.sh
```

Use a single line Linux command to make your test run:

```
bash plot_all.sh 'west' 'east' 'south' 'north'
```

Where **'west'** and **'east'** are the western and eastern extent of **your country** (in degrees) respectively, while **'south'** and **'north'** are the southern and northern extent.

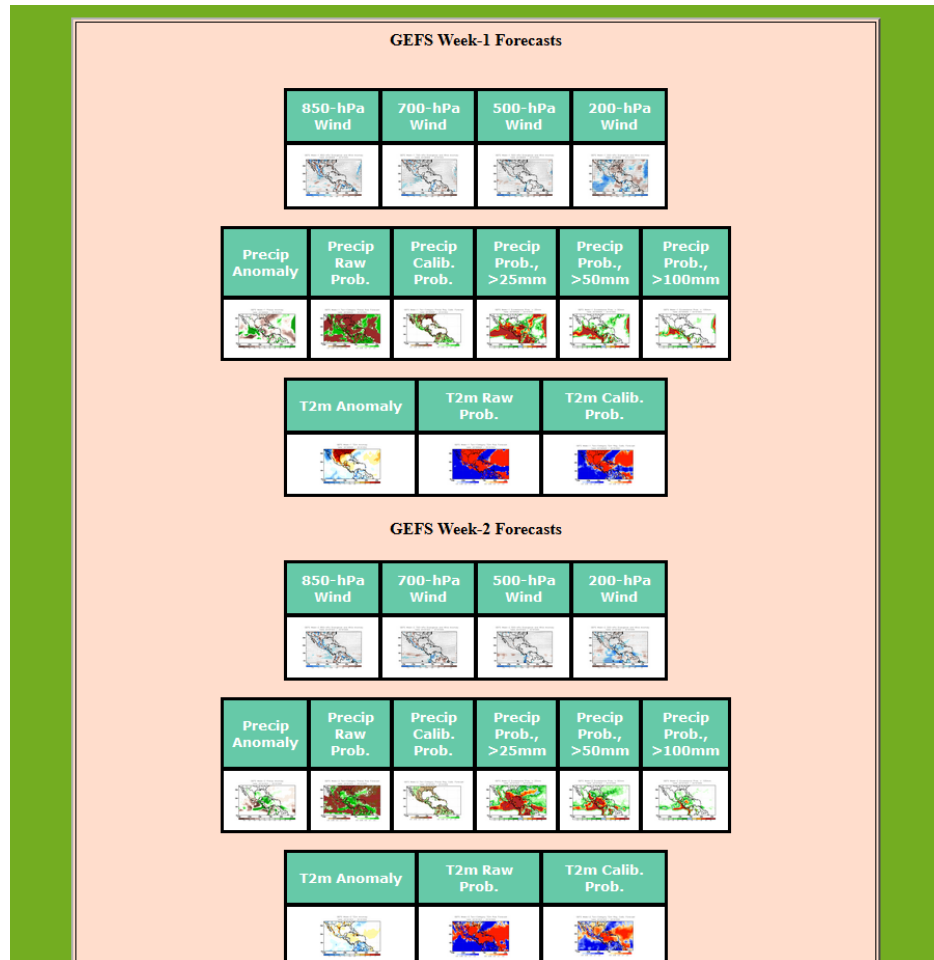
e.g, a test run for Central America and the Caribbean Region:

```
bash plot_all.sh -120 -40 0 35 (example)
```

Note: **longitudes** in the **western hemisphere** and **latitudes** in the **southern hemisphere** have negative values.

Test Run Output

Depending on your Internet browser security setting, a webpage with your test run output should popup automatically:



Generate a Blank Country Map

- Use the command below to generate a blank country map.

```
bash blank_map.sh 'west' 'east' 'south' 'north'
```

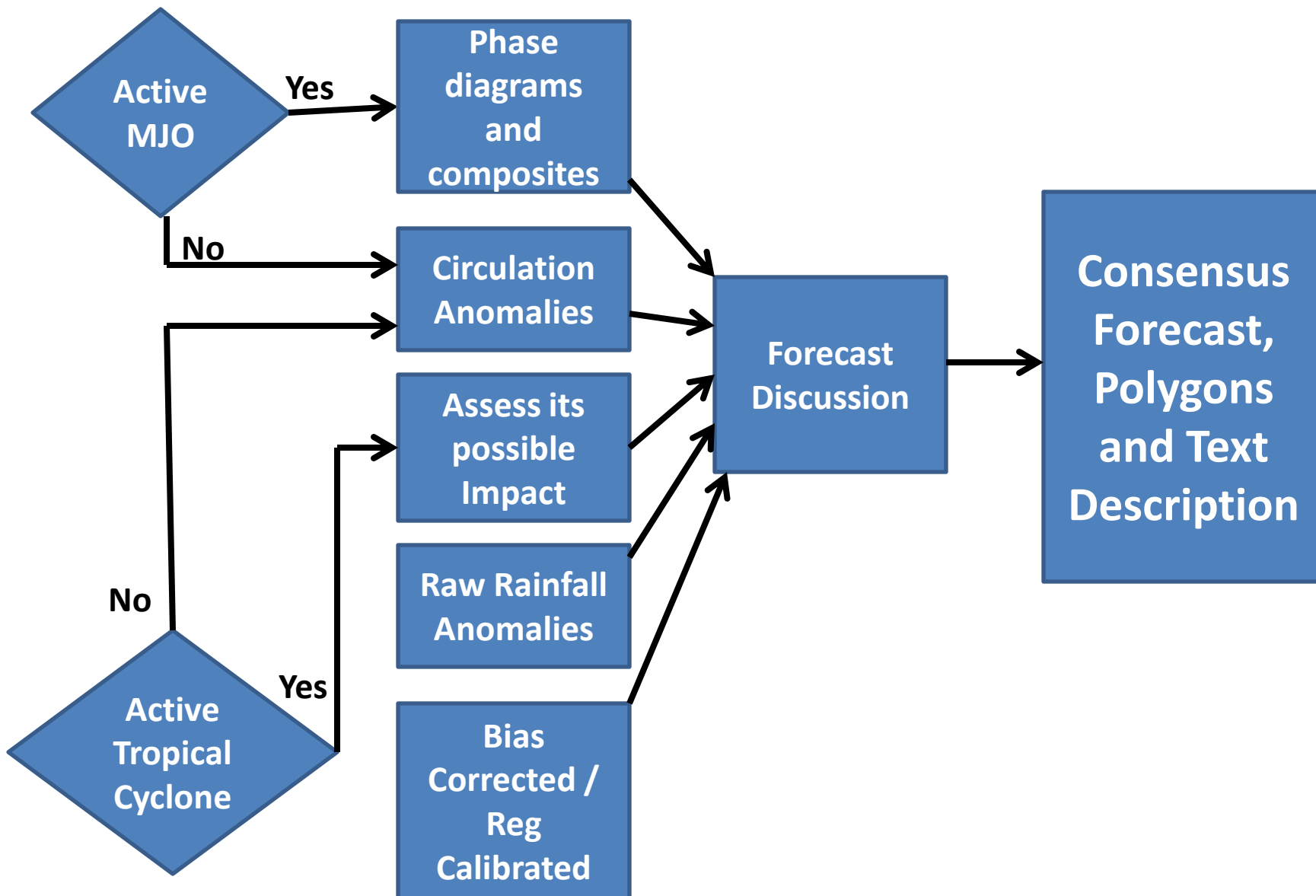
Where **'west'** and **'east'** are the western and eastern extent of **your country** (in degrees) respectively, while **'south'** and **'north'** are the southern and northern extent.

- You may use your file explorer to locate the blank country map
 - For Cygwin users, under

```
C:/cygwin64/home/your_user_name/subseason/blank_map.png
```

- You will use this map to draw forecast polygons, later during the exercise

Remember: Week-1/2 Forecast Process



Remember: Week-1/2 Forecast Tools

- Active MJO?
- Active tropical cyclone/Hurricane/typhoon activity?
- Significant SST and circulation anomaly patterns?

200-hPa Velocity Potential Anomaly

https://www.cpc.ncep.noaa.gov/products/precip/CWlink/ir_anim_monthly.shtml

- Green shade indicates areas of upper level divergence and convection or precipitation at surface. Brown contours indicate areas of upper level convergence or subsidence and suppressed precipitation at surface.

Wheeler-Hendon Index - Forecasts

GFS/GEFS

https://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/combphase_noCFSfull.gif

Statistical

https://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/statphase_full.gif

CFSv2

https://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/CLIVAR/CFSO_phase_small.gif

ECMWF

https://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/CLIVAR/ECMF_phase_MANOM_51m_small.gif

JMAN

https://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/CLIVAR/JMAN_phase_51m_small.gif

CMET

https://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/CLIVAR/CANM_phase_20m_small.gif

Evolution of MJO-related anomalies

Initial date: 2 October 2019

https://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/spatial_olrmap_full.gif

Red shade indicate areas of suppressed convection

Blue shade indicate areas of enhanced convection

1 - 5 days ave. Forecast

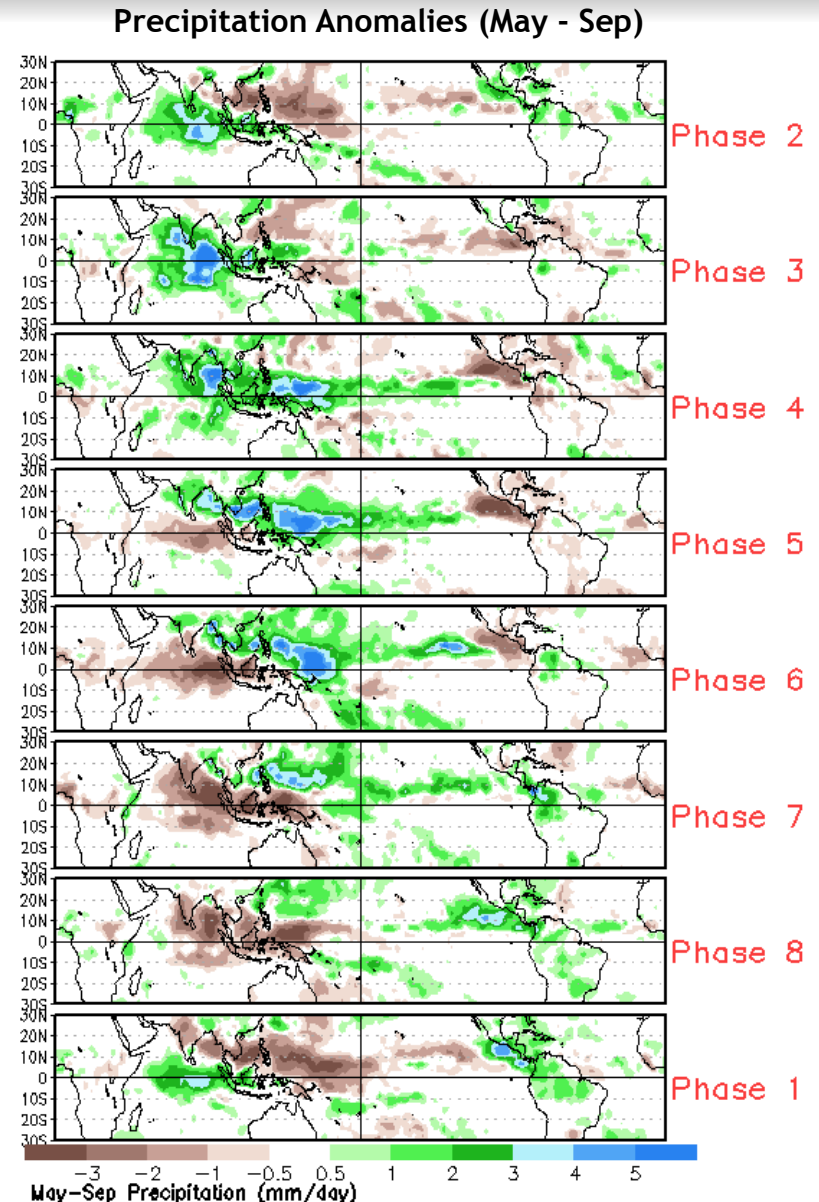
6-10 days ave. Forecast

11-15 days ave. Forecast

MJO Rainfall Composites - Global Tropics

http://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/plot_pcp_tvalue_8pan_maysep.gif (May - Sep Season)

http://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/plot_pcp_tvalue_8pan_novmar.gif (Nov - Mar Season)



Week-2, MJO Contribution?

- Do the MJO predictions suggest enhanced/suppressed rainfall?

NCEP GEFS Wind and Divergence Anomaly Forecast Week-2, Valid: 11 - 17 October, 2019

850-hPa or 700-hPa

200-hPa

NCEP GEFS/CFSv2, Precip forecasts for Week-2,

Valid: 11 - 17 October, 2019

Ensemble Mean Anomaly

Two-category Probabilistic
Forecast - Raw

Two-category Probabilistic
Forecast – Reg - Calibrated

GEFS

CFSv2

NCEP GEFS/CFSv2, 2m Temp. forecasts for Week-2,

Valid: 11 - 17 October, 2019

Ensemble Mean Anomaly

Two-category Probabilistic
Forecast - Raw

Two-category Probabilistic
Forecast – Reg - Calibrated

GEFS

CFSv2

GEFS Week-2 Exceedance Probability, Valid: 11 - 17 October, 2019

>25mm

>50mm

>100mm

Week-2 Rainfall, Convergence of Evidence?

- **Wet**

- MJO ->
- Lower/upper-level wind/divergence anomalies ->
- Rainfall Model Guidance ->
- Exceedance Probability ->

- **Dry**

- MJO ->
- Lower/upper-level wind/divergence anomalies ->
- Rainfall Model Guidance ->
- Exceedance Probability ->

Week-2 **2m Temp.**, Convergence of Evidence?

- **Cool**

- MJO?

- Lower/upper-level wind/divergence anomalies ->

- 2m Temperature Model Guidance ->

- **Warm**

- MJO?

- Lower/upper-level wind/divergence anomalies ->

- 2m Temperature Model Guidance ->

Week-2 Rainfall Outlook, 11 - 17 October, 2019

- Insert your blank map here
- Use the ppt oval drawing tool to draw forecast polygons
 - **Blue**, for above-average rainfall and
 - **Red** for below-average rainfall

2. **Forecast:** Reason.
3. **Forecast:** Reason.
4. **Forecast:** Reason.

1. **Forecast:** Reason.

Week-2, 2m Temp. Outlook, 11 - 17 October, 2019

- Insert your blank map here
- Use the ppt oval drawing tool to draw forecast polygons
 - **Red**, for above-average temperature and
 - **Blue** for below-average temperature

1. **Forecast:** Reason.

2. **Forecast:** Reason.

3. **Forecast:** Reason.

4. **Forecast:** Reason.